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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Paul Thurk

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EXAMINER

WON, BUMSUK

ART UNIT

PAPER NUMBER

2879

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Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/814,295	<b>Applicant(s)</b> THURK ET AL.	
	<b>Examiner</b> Bumsuk Won	<b>Art Unit</b> 2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/04, 11/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 47-49 are rejected under 35 U.S.C. 102(b) as being anticipated by Bulovic (US 2004/0023010).**

Regarding claim 47, Bulovic discloses a phosphor material comprising a plurality of domains disposed on an organic film (paragraph 62), each domain comprising a plurality of luminescent semiconductor nanoparticles having a monodisperse size distribution (paragraph 34).

Regarding claim 48, Bulovic discloses a phosphor material wherein the organic film has a plurality of luminescent nanoparticles dispersed therein (paragraph 46).

Regarding claim 49, Bulovic discloses a phosphor material wherein the luminescent nanoparticles dispersed in the organic film have a monodisperse size distribution (paragraphs 34 and 46).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1-5 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Srivastava (2003/0067265) in view of Fink (US 2003/0057821).**

Regarding claim 1, Srivastava discloses a light emitting device comprising: (a) a primary light source (figure 2, 1); and (b) a phosphor material (figure 2, 3, paragraph 50) which absorbs at least a portion of the primary light and emits a secondary light (paragraph 18), wherein the secondary light or the combination of the secondary light with the primary light comprises a white light (paragraph 19).

Srivastava does not disclose the white light with a color rendering index of at least 90.

Fink discloses Group IV semiconductor silicon nanoparticles to be used for the phosphor material (abstract), which is described in the Applicant's specification to get the color rendering index of at least 90, for the purpose of higher efficiency.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Group IV semiconductor silicon nanoparticles to be used for the phosphor material to get the color rendering index of at least 90 disclosed by Fink in the light emitting device disclosed by Srivastava, for the purpose of higher efficiency.

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Regarding claim 2, Srivastiva discloses all of the claimed limitations except for the white light has a color rendering index of at least 95.

Fink discloses Group IV semiconductor silicon nanoparticles to be used for the phosphor material (abstract), which is described in the Applicant's specification to get the color rendering index of at least 95. The reason for combining is the same as for claim 1 above.

Regarding claim 3, Srivastiva discloses all of the claimed limitations except for the white light has a color rendering index of 100.

Fink discloses Group IV semiconductor silicon nanoparticles to be used for the phosphor material (abstract), which is described in the Applicant's specification to get the color rendering index of 100. The reason for combining is the same as for claim 1 above.

Regarding claim 4, Srivastiva discloses all of the claimed limitations except for the device produces white light with an efficiency of at least 30 lm/w.

Fink discloses Group IV semiconductor silicon nanoparticles to be used for the phosphor material (abstract), which is described in the Applicant's specification to get the white light with an efficiency of at least 30 lm/w. The reason for combining is the same as for claim 1 above.

Regarding claim 5, Srivastiva discloses the primary light is ultraviolet (paragraph 54) or blue light (paragraph 11).

Regarding claim 13, Srivastava discloses the phosphor material has an emission profile comprising red, green, and blue emission peaks, since the emission profile comprising red, green, and blue emission peaks is an intrinsic property of the phosphor that is disclosed by Srivastava.

**Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Srivastava (2003/0067265) in view of Fink (US 2003/0057821), in further view of Odaki (US 2004/0145307).**

Regarding claim 6, Srivastava in view of Fink discloses all of the claimed limitations except for the primary light comprises wavelengths of from 320 nm to 480 nm and the secondary light has a lower energy than the primary light.

Odaki discloses the primary light comprises wavelengths of from 320 nm to 480 nm and the secondary light has a lower energy than the primary light (paragraphs 9 and 56), for the purpose of generating blue or ultraviolet light.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the primary light comprises wavelengths of from 320 nm to 480 nm and the secondary light has a lower energy than the primary light disclosed by Odaki in the light emitting device disclosed by Srivastava, for the purpose of generating blue or ultraviolet light.

Regarding claim 7, Srivastava in view of Fink discloses the primary light source is a light emitting diode (paragraph 15).

**Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Srivastava (2003/0067265) in view of Fink (US 2003/0057821), in further view of Isoda (US 2003/0186023).**

Regarding claim 8, Srivastava in view of Fink discloses all of the claimed limitations except for the primary light source is an infrared light source and the secondary light has a higher energy than the infrared light.

Isoda discloses the primary light source is an infrared light source and the secondary light has a higher energy than the infrared light (paragraph 2), for the purpose of generating infrared light.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the primary light source is an infrared light source and the secondary light has a higher energy than the infrared light disclosed by Isoda in the light emitting device disclosed by Srivastava, for the purpose of generating infrared light.

Regarding claim 9, Srivastava in view of Fink discloses the primary light source is a red light emitting diode (paragraph 11).

**Claims 10-12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Srivastava (2003/0067265) in view of Fink (US 2003/0057821).**

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Regarding claim 10, Srivastava discloses all of the claimed limitations except for the phosphor material comprises a plurality of nanoparticles.

Fink discloses the phosphor material comprises a plurality of nanoparticles (paragraph 3), for the purpose of higher efficiency (paragraph 4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the phosphor material comprises a plurality of nanoparticles disclosed by Fink in the light emitting device disclosed by Srivastava, for the purpose of higher efficiency.

Regarding claim 11, Fink discloses the nanoparticles comprise a Group IV semiconductor (abstract).

The reason for combining is the same as for claim 10 above.

Regarding claim 12, Fink discloses the nanoparticles have an average particle diameter of from 1 to 150 angstroms (paragraph 17).

The reason for combining is the same as for claim 10 above.

Regarding claim 14, Fink discloses the Group IV semiconductor is silicon (abstract).

The reason for combining is the same as for claim 10 above.

**Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Srivastava (2003/0067265) in view of Fink (US 2003/0057821), in further view of Kim (US 2004/0109666).**



Regarding claim 15, Srivastava in view of Fink discloses all of the claimed limitations except for the Group IV semiconductor is germanium.

Kim discloses the Group IV semiconductor is germanium (paragraph 74), for the purpose of providing electrical communication between layers and source of electrical energy (paragraph 25).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the Group IV semiconductor is germanium disclosed by Kim in the light emitting device disclosed by Srivastava in view of Fink, for the purpose of providing electrical communication between layers and source of electrical energy.

**Claims 16-19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Srivastava (2003/0067265) in view of Fink (US 2003/0057821).**

Regarding claim 16, Srivastava discloses a light emitting device comprising: (a) a primary light source (figure 2, 1) which emits primary light (figure 2, 2); and (b) a phosphor material (figure 2, 3, paragraph 50) which absorbs at least a portion of the primary light and emits a secondary light (paragraph 18), wherein the secondary light or the combination of the secondary light with the primary light comprises a white light (paragraph 19).

Srivastava does not disclose the phosphor material comprising a plurality of nanoparticles and the white light is produced with an efficiency of at least 30 lm/w.

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Fink discloses the phosphor material comprising a plurality of nanoparticles (paragraph 3), for the purpose of higher efficiency (paragraph 4).

The white light is produced with an efficiency of at least 30 lm/w does not have a patentable weight since it is operational limitation and does not affect the structural limitation of the claim.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the phosphor material comprising a plurality of nanoparticles disclosed by Fink in the light emitting device disclosed by Srivastava, for the purpose of higher efficiency.

Regarding claim 17, Fink discloses the nanoparticles comprise a Group IV semiconductor (abstract).

The reason for combining is the same as for claim 16 above.

Regarding claim 18, Fink discloses the nanoparticles have an average particle diameter of from 1 to 150 angstroms (paragraph 17).

The reason for combining is the same as for claim 16 above.

Regarding claim 19, Srivastava in view of Fink discloses the phosphor material has an emission profile comprising red, green, and blue emission peaks, since the emission profile comprising red, green, and blue emission peaks is an intrinsic property of the phosphor that is disclosed by Srivastava in view of Fink.

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Regarding claim 20, Fink disclose the Group IV semiconductor is silicon (abstract).

The reason for combining is the same as for claim 16 above.

**Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Srivastava (2003/0067265) in view of Fink (US 2003/0057821), in further view of Kim (US 2004/0109666).**

Regarding claim 21, Srivastava in view of Fink discloses all of the claimed limitations except for the Group IV semiconductor is germanium.

Kim discloses the Group IV semiconductor is germanium (paragraph 74), for the purpose of providing electrical communication between layers and source of electrical energy (paragraph 25).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the Group IV semiconductor is germanium disclosed by Kim in the light emitting device disclosed by Srivastava in view of Fink, for the purpose of providing electrical communication between layers and source of electrical energy.

**Claims 22-23, 26, 30-33 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Srivastava (2003/0067265) in view of Fink (US 2003/0057821).**

Regarding claim 22, Srivastava discloses a light emitting device comprising: (a) a primary light source (figure 2, 1) which emits primary light (figure 2, 2); and (b) a phosphor

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material (figure 2, 3, paragraph 50) which absorbs at least a portion of the primary light and emits a secondary light (paragraph 18), wherein the secondary light or the combination of the secondary light with the primary light comprises a white light (paragraph 19).

Srivastava does not disclose the phosphor material comprising a plurality of nanoparticles, the nanoparticles comprising a Group IV semiconductor.

Fink discloses the phosphor material comprising a plurality of nanoparticles (paragraph 3), the nanoparticles comprising a Group IV semiconductor (abstract), for the purpose of higher efficiency (paragraph 4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the phosphor material comprising a plurality of nanoparticles, the nanoparticles comprising a Group IV semiconductor disclosed by Fink in the light emitting device disclosed by Srivastava, for the purpose of higher efficiency.

Regarding claim 23, Srivastava discloses the primary light is ultraviolet or blue light (paragraph 11).

Regarding claim 26, Srivastava discloses the primary light source is a fluorescent lamp (paragraph 3).

Regarding claim 30, Fink discloses the nanoparticles have an average particle diameter of from 1 to 150 angstroms (paragraph 17).

The reason for combining is the same as for claim 22 above.

Regarding claim 31, Srivastava in view of Fink discloses the phosphor material has an emission profile comprising emission peaks in the green to red regions of the visible spectrum, since emission peaks in the green to red regions of the visible spectrum is an intrinsic property of the phosphor that is disclosed by Srivastava in view of Fink.

Regarding claim 32, Srivastava in view of Fink discloses the phosphor material has an emission profile comprising emission peaks in the blue to red regions of the visible spectrum, since the emission peaks in the blue to red regions of the visible spectrum is an intrinsic property of the phosphor that is disclosed by Srivastava in view of Fink.

Regarding claim 33, Fink discloses the Group IV semiconductor is silicon (abstract).  
The reason for combining is the same as for claim 22 above.

Regarding claim 40, Srivastava discloses the nanoparticles are dispersed in a binder (paragraph 47).

**Claims 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Srivastava (2003/0067265) in view of Fink (US 2003/0057821), in further view of Odaki (US 2004/0145307).**

Regarding claim 24, Srivastava in view of Fink discloses all of the claimed limitations except for the primary light comprises wavelengths of from 320 nm to 480 nm and the secondary light has a lower energy than primary light.

Odaki discloses the primary light comprises wavelengths of from 320 nm to 480 nm and the secondary light has a lower energy than primary light (paragraphs 9 and 56), for the purpose of generating blue or ultraviolet light.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the primary light comprises wavelengths of from 320 nm to 480 nm and the secondary light has a lower energy than primary light disclosed by Odaki in the light emitting device disclosed by Srivastava, for the purpose of generating blue or ultraviolet light.

Regarding claim 25, Srivastava discloses the primary light source is a blue light emitting diode or an ultraviolet light emitting diode (paragraph 11).

Regarding claim 26, Srivastava discloses the primary light source is a fluorescent lamp (paragraph 3).

**Claims 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Srivastava (2003/0067265) in view of Fink (US 2003/0057821), in further view of Isoda (US 2003/0186023).**

Regarding claim 27, Srivastava in view of Fink discloses all of the claimed limitations except for the primary light source is an infrared light source and the secondary light has a higher energy than the infrared light.

Isoda discloses the primary light source is an infrared light source and the secondary light has a higher energy than the infrared light (paragraph 2), for the purpose of generating infrared light.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the primary light source is an infrared light source and the secondary light has a higher energy than the infrared light disclosed by Isoda in the light emitting device disclosed by Srivastava in view of Fink, for the purpose of generating infrared light.

Regarding claim 28, Srivastava discloses the primary light source is a red light emitting diode (paragraph 11).

**Claims 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Srivastava (2003/0067265) in view of Fink (US 2003/0057821), in further view of Isoda (US 2003/0186023), in further view of Kashima (US 2004/0124352).**

Regarding claim 29, Srivastava in view of Fink, in further view of Isoda discloses all of the claimed limitations except for the primary light source is a halogen lamp or an incandescent lamp.

Kashima discloses the primary light source is a halogen lamp or an incandescent lamp (paragraph 46), for the purpose of generating infrared light.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a halogen lamp or an incandescent lamp for the primary light source disclosed by Kashima in the light emitting device disclosed by Srivastava in view of Fink, in further view of Isoda, for the purpose of generating infrared light.

**Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Srivastava (2003/0067265) in view of Fink (US 2003/0057821), in further view of Kim (US 2004/0109666).**

Regarding claim 34, Srivastava in view of Fink discloses all of the claimed limitations except for the Group IV semiconductor is germanium.

Kim discloses the Group IV semiconductor is germanium (paragraph 74), for the purpose of providing electrical communication between layers and source of electrical energy (paragraph 25).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the Group IV semiconductor is germanium disclosed by Kim in the light emitting device disclosed by Srivastava in view of Fink, for the purpose of providing electrical communication between layers and source of electrical energy.



**Claims 35-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Srivastava (2003/0067265) in view of Fink (US 2003/0057821), in further view of Lee (US 2004/0036130).**

Regarding claim 35, Srivastava in view of Fink discloses all of the claimed limitations except for the nanoparticles comprises core/shell nanoparticles comprising a Group IV semiconductor core and an inorganic shell.

Lee discloses the nanoparticles comprises core/shell nanoparticles comprising a Group IV semiconductor core and an inorganic shell (paragraphs 77 and 78), for the purpose of emitting light.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the nanoparticles comprises core/shell nanoparticles comprising a Group IV semiconductor core and an inorganic shell disclosed by Lee in the light emitting device disclosed by Srivastava in view of Fink, for the purpose of emitting light.

Regarding claim 36, Lee discloses the inorganic shell comprises ZnS or CdS (paragraphs 77 and 78).

The reason for combining is the same as for claim 35 above.

Regarding claim 37, Lee discloses the core comprises silicon and the shell comprises Ge (paragraphs 77 and 78).

The reason for combining is the same as for claim 35 above.

Regarding claim 38, Lee discloses the core comprises silicon and the shell comprises Ge (paragraphs 77 and 78).

The reason for combining is the same as for claim 35 above.

Regarding claim 39, Lee discloses the core comprises germanium and shell comprises Si (paragraphs 77 and 78).

The reason for combining is the same as for claim 35 above.

**Claims 41-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Srivastava (2003/0067265) in view of Fink (US 2003/0057821), in further view of Shiang (US 2004/0027062).**

Regarding claim 41, Srivastava in view of Fink discloses all of the claimed limitations except for the primary light source comprises an electroluminescent device.

Shiang discloses the primary light source comprises an electroluminescent device (paragraph 43), for the purpose of generating light.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the primary light source comprises an electroluminescent device disclosed by Shiang in the light emitting device disclosed by Srivastava in view of Fink, for the purpose of generating light.

Shiang discloses the primary light source comprises an organic light emitting material (paragraph 45).

The reason for combining is the same as for claim 41 above.

Shiang discloses the nanoparticles are dispersed in the organic light emitting material (paragraph 45).

The reason for combining is the same as for claim 41 above.

**Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fink (US 2003/0057821) in view of Singh (Nanoparticulate Materials) which is the Applicant's admitted prior art.**

Regarding claim 44, Fink discloses a phosphor material comprising a plurality of luminescent group IV semiconductor nanoparticles dispersed in a binder (paragraph 21).

Fink does not disclose the plurality of luminescent group IV semiconductor nanoparticles having a polydisperse size distribution (page 20, lines 11-12), for the purpose of having higher efficiency (page 21, conclusion, line 4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the plurality of luminescent group IV semiconductor nanoparticles having a polydisperse size distribution disclosed by Singh in the phosphor material disclosed by Fink, for the purpose of having higher efficiency.

**Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fink (US 2003/0057821) in view of Singh (Nanoparticulate Materials) which is the Applicant's admitted prior art, in further view of Kinlen (US 2004/0018382).**

Regarding claim 45, Fink in view of Singh discloses all of the claimed limitations except for a phosphor material further comprising a plurality of electroluminescent particles dispersed in the binder.

Kinlen discloses a phosphor material further comprising a plurality of electroluminescent particles dispersed in the binder (paragraphs 31 and 61), for the purpose of emitting light.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a phosphor material further comprising a plurality of electroluminescent particles dispersed in the binder disclosed by Kinlen in the phosphor material disclosed by Fink in view of Singh, for the purpose of emitting light.

**Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fink (US 2003/0057821) in view of Singh (Nanoparticulate Materials) which is the Applicant's admitted prior art, in further view of Roberts (US 2002/0004251).**

Regarding claim 46, Fink in view of Singh discloses all of the claimed limitations except for the binder is an electroluminescent polymer.

Roberts discloses the binder is an electroluminescent polymer (paragraph 97), for the purpose of emitting light.

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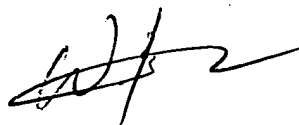
It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the binder being an electroluminescent polymer disclosed by Roberts in the phosphor material disclosed by Fink in view of Singh, for the purpose of emitting light.

***Contact information***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bumsuk Won whose telephone number is 571-272-2713. The examiner can normally be reached on Monday through Friday, 8:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Bumsuk Won  
Patent Examiner

  
**JOSEPH WILLIAMS**  
**PRIMARY EXAMINER**